Final Corrective Measures Proposal
Henkel Technologies Facility
Morenci, Michigan
MID 058 723 867

Prepared for
Mr. Jack Garavanta, Director
Environmental Compliance
Henkel Technologies
32100 Stephenson Highway
Madison Heights, Michigan 48071

Prepared by
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Project #1004-05

October 12, 2005

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MID 058 723 867

REPLY TO THE ATTENTION OF

DE-9J

October 25, 2005

Mr. Jeffrey A. Bolin, M.S., CHMM
Environmental Scientist
Dragun Corporation
30445 Northwestern Highway - Suite 260
Farmington Hills, MI 48334

RE: Final Corrective Measures Proposal
Henkel Surface Technologies
Morenci, MI Site

Dear Mr. Bolin:

The U.S. Environmental Protection Agency Region 5 (US EPA) has received Henkel's Final Corrective Measures Proposal, for the Morenci, Michigan site, dated October 12, 2005. US EPA has reviewed this proposal and finds the corrective measures chosen. (ie. deed restriction to commercial industrial land use and deed restriction prohibiting use of shallow groundwater) approvable. This letter serves as US EPA's approval of the proposal.

Please send copies of the application for the deed restrictions, as well as a copy of the final restricted deeds, for the US EPA's corrective action records for the site.

As is the case with any RCRA Corrective Action, should information come to the attention of the US EPA warranting further corrective action at the site, US EPA reserves the right to issue additional corrective action order(s) to address such situation(s).

If you have any questions about this correspondence, please call me at (312)353-2720. Any legal questions regarding the above issues at the site should be addressed to Andre Daugavietis, Associate Regional Counsel. Mr. Daugavietis can be telephoned at (312) 886-6663.

Sincerely,

Brian P. Freeman
Senior Chemist, Corrective Action Project Manager
U.S. EPA Region 5, RCRA Enforcement & Compliance Assurance

cc: George Hamper, Chief, WPTD/ECAB Corrective Action Section
Pete Quackenbush, MDEQ
Andre Daugavietis, Esq. C-14J
Jack Garavanta, Henkel Corporation

Dragun Corporation

30445 Northwestern Hwy. • Suite 260 • Farmington Hills, MI, USA 48334 • 248-932-0228 • FAX 248-932-0618

October 12, 2005

Mr. Brian Freeman
Senior Chemist
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
United States Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

SUBJECT: Final Corrective Measures Proposal
Former Morenci Facility
Morenci, Michigan
Project #1004-05

Dear Mr. Freeman:

Enclosed are three copies of the Final Corrective Measures (FCM) Proposal for the Henkel Technologies (HT) property located in Morenci, Michigan (the Site). This FCM Proposal was prepared in response to Section V (B) of the AGREED ADMINISTRATIVE ORDER (AAO) between representatives of the United States Environmental Protection Agency (USEPA) Region 5 and HT that was signed on February 14, 2005.

The AAO was negotiated based on the previous investigations and remedial activities conducted at the Site. Based on that information, only one outstanding issue remained. In Section V.A. of the AAO, it was agreed that HT would conduct additional soil removal between the former Waste Storage Area 6 and Bean Creek. These activities were conducted from May 18, 2005, to June 3, 2005, and were reported to USEPA in a report entitled "Limited Soil Removal Report, Former Henkel Morenci Facility, Morenci, Michigan, USEPA ID No: MID 058 723 867," dated July 18, 2005.

The USEPA responded to the Limited Soil Removal Report in a letter dated July 29, 2005. The letter indicated that soil removal activities met the requirements of the AAO. Accordingly, based on results of the recent soil removal and the previously submitted reports, the requirements outlined in the AAO have been obtained.

HT submitted a Description of Current Conditions (DOCC) Report dated August 17, 2005, to the USEPA Region 5. The DOCC provided a brief summary of the history and current status of operations, potential areas of concern, and investigations and corrective actions conducted at the former HT Facility. The DOCC included a summary of numerous soil, groundwater, and sediment investigations conducted at the Site since the late 1980s and up to the most recent soil removal activities conducted adjacent to former Waste Storage Area #6.

In the DOCC Report, The Dragun Corporation states that "it is The Dragun Corporation's opinion that objectives set forth in the AAO have been satisfied." The USEPA responded to the DOCC Report in a letter dated September 15, 2005. The letter indicated that the DOCC Report accurately states the current conditions at the facility and the USEPA approves this report.

Based on review of the previous investigations, all of the soil, fill material, and groundwater samples that have been collected at the Site meet generic cleanup criteria that are protective of human health for industrial and commercial II, III, and IV land use. To ensure that the Site continues to be used in an industrial or commercial II, III, or IV capacity, HT will restrict current and future use of the site to industrial or commercial II, III, or IV land use via a deed restriction. Additionally, HT will record a deed restriction on the Site restricting the use of shallow groundwater.

In summary, based on this information, residual chemical concentrations in soil and groundwater at the Site do not pose an unacceptable risk to human health or the environment based on MDEQ Part 201 cleanup criteria and considering the property use restrictions that HT has proposed and is prepared to implement.

It is The Dragun Corporation's opinion that no further corrective measures are required beyond the implementation of these deed restrictions. Additionally, it is The Dragun Corporation's opinion that, since no further corrective measures are required, a Final Remedy Construction Completion Report is not necessary.

Upon USEPA approval of these remedy concepts, draft land use restrictions will be prepared and forwarded to the USEPA for review.

If you have any questions or comments regarding this report or wish to discuss these matters in greater detail, please contact us at (248) 932-0228.

Sincerely,

THE DRAGUN CORPORATION

Allan Clifford Lawton, M.Sc.
Geologist

Jeffrey A. Bolin, M.S., CHMM
Vice President – Technical Operations

Attachment

ACL/JAB/lrm

Cc: Jack Garavanta, Henkel Technologies
Glenn Young, Esq., Henkel Technologies
Ken Gold, Esq, Honigman Miller Schwartz &Cohn

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INTRODUCTION

The Dragun Corporation on behalf of Mr. Jack Garavanta of Henkel Technologies (HT) prepared this Final Corrective Measures (FCM) Proposal for the Former HT Facility in Morenci, Michigan (the Site) pursuant to Section V (B) of the AGREED ADMINISTRATIVE ORDER (AAO) negotiated between HT and the United States Environmental Protection Agency (USEPA), Region 5 (effective date February 14, 2005). The FCM Proposal provides a brief summary of the history and current status of operations, potential areas of concern, and investigations and corrective actions conducted at the former HT Facility (refer to Figures 1, 2, and 3).

Additionally, this FCM Proposal includes a summary of numerous soil, groundwater, and sediment investigations conducted at the Site since the late 1980s and up to the most recent soil removal activities conducted adjacent to former Waste Storage Area #6. Further, the FCM Proposal presents those measures deemed necessary to ensure that the site does not pose an unacceptable risk to human health and the environment.

SITE BACKGROUND

Site Location

The Site is located on the west side of Mill Street approximately 350 feet north of Main Street in Morenci; Lenawee County, Michigan. The Site contains approximately four acres of grass covered land and is completely fenced. Bean Creek trends north/south near the western property boundary.

Surrounding Land Use

The Site is located in a predominantly urban area (see Figures 1 and 2). Commercial properties are located south and southeast of the Site. Bean Creek and a public park are located west of the Site, residential properties are located east of the Site, and agricultural land is located north of the Site.

Climate

The climate of Lenawee County is influenced by the Great Lakes. The waters of Lake Erie and of the other lakes, to a lesser extent, have a slight tempering effect on the temperature in the summer.

The average annual precipitation in Lenawee County is 33.93 inches per year. In an average year, 50% of the precipitation will fall during the months of May through September. In Lenawee County, the average daily winter and summer temperatures are 25.8° and 70.9° Fahrenheit (F), respectively. The coolest month of the year is usually January; the warmest month of the year is usually July.

Soils

The native soils of the Site are of the Bronson and Griffin Series. The Bronson Series soils are moderately well-drained, sandy or loamy materials that overlie calcareous, stratified sand and gravel (USDA, 1961). This soil series occurs on glacial outwash plains and terraces; on old shorelines and beach ridges on the lakebed plain; and on terraces adjacent to stream valleys.

The Griffin Series soils are nearly level and are imperfectly drained (USDA, 1961). This soil series occurs in old stream channels and swales on alluvial flood plains or bottom lands. These soils are subject to fresh deposits during periods of flooding. These soils are predominantly loams and sandy loams.

Regional Geology

The Site is located within the Eastern Lakes Section, a subdivision of the Central Lowland physiographic division. The regional topography ranges from flat to gently rolling with local relief usually less than 40 feet (Western Michigan University, 1981).

Glacial drift around the Site has been classified as deltaic and spillway sand and silt. This unit trends northeast as a narrow band and is bounded on the west and east by moraine deposits. Further east of the Site, the surficial deposits are composed of fine sand to clay that were deposited in a lacustrine environment. West of the Site the surficial drift is dominated by moraine and ground moraine deposits.

Bedrock underlying the Site is limestone or shale of the Coldwater Formation (Western Michigan University, 1981). Based on a review of regional cross-sections, bedrock is present at the Site at a depth of approximately 150 to 200 feet below ground level (BGL) (Western Michigan University, 1981).

Earth Tech completed a report titled "Final Hydrogeologic Study and Wellhead Protection Area Delineation" in July of 1997. As previously discussed, drinking water in the area is provided by the City of Morenci Water System, which obtains water from two production wells installed in the lower confined aquifer. The lower confined aquifer is encountered at depths of approximately 85 and 95 feet at the former production well and the City of Morenci's municipal wells, respectively. The lower confined aquifer consists of sand and gravel units and is at least

20 feet thick. Earth Tech (1997) indicated that the lower confined aquifer is under artesian pressure.

Artesian pressure means that the static water level of the lower confined aquifer is above the ground surface. Since the static water level of the lower confined aquifer is above the water level of the upper aquifer, the lower confined aquifer is effectively isolated from the upper unconfined aquifer.

Local Geology

To assess local geology at the Site, The Dragun Corporation reviewed the subsurface investigations that have been previously conducted on the Site (D'Appolonia Consulting Engineers, Inc., 1983; Huff & Huff, Inc., 1988; Dell Engineering, Inc., 1989; and Dragun, 1995a, 1995b, 1995c, 1997, 1999, 2000, 2001, 2002, 2005). In addition, a hydrogeologic study and well head protection area delineation was prepared for the City of Morenci (Earth Tech, 1997). These documents have previously been provided to the USEPA. Based on review of the subsurface information, the Property is underlain by (a) a sand unit and (b) a clay unit. Each unit is discussed in greater detail in the following text.

Sand Unit: Present at the surface of the Property is a fine to medium sand with trace to some gravel. This sand unit is laterally extensive and saturated with water approximately 10 to 11 feet below grade level (bgl). The thickness of the sand is approximately 17.5 feet. Site-specific data (Dragun, 2002) indicate that groundwater from the Site cannot underflow Bean Creek. First, the thin water-bearing zone beneath Bean Creek is not conducive to underflow. Second, vertical hydraulic gradients indicate an upward vertical hydraulic gradient. Finally, groundwater elevations are higher on either side of Bean Creek, which means that groundwater from both sides of Bean Creek discharges into Bean Creek and there can be no underflow. Accordingly, the down gradient receptor of groundwater from the Site is limited to Bean Creek.

Clay Unit: A stiff to very hard, gray, silty clay with trace amounts of sand and gravel is present below the sand unit. This clay unit was encountered at a depth of approximately 17.5 feet bgl. Based on review of both the City of Morenci municipal well log and the production well log, this clay unit extends to a depth of approximately 95 feet BGL.

Drinking water is supplied to area residents via the municipal water supply provided by the City of Morenci. The closest drinking water well to the Site is the City of Morenci municipal water supply wells. These wells are located approximately 800 feet southwest of the Property. A lower water-bearing zone was encountered at a depth of approximately 95 feet at the City of Morenci municipal well. The lower water-bearing zone consists of sand and gravel units and is at least 20 feet thick. An approximately 75-foot-thick clay unit separates the upper water-bearing zone from the lower water-bearing zone. This clay unit which underlies the upper water-bearing zone is considered to be a confining unit (Earth Tech, 1997).

Site and Regional Topography

The Site is located in Lenawee County, Michigan in the northwest portion of the 7.5 minute Morenci, Michigan-Ohio topographic quadrangle (see Figure 1). The Site is generally flat with a gentle slope to the west; however, Bean Creek is located adjacent to the west side of the Site and the ground surface has a steep slope adjacent to the creek. The City of Morenci is located in a glacial outwash valley that trends northeast to southwest. Low moraine ridges are located east and west of the City of Morenci.

Surface Water Drainage

Based on the regional and Site topography, surface water on the Site drains to the west. The surface water discharges to Bean Creek, which flows to the south-southwest.

Current Site Use and Site Description

The Site is currently vacant and covered with grass. No industrial operations are currently conducted on the Site. The east portion of the Site has been legally separated and sold to the City of Morenci.

Historical operations at the Site include the manufacture and warehousing of chemical surface coating products by numerous owner/operators. Prior to these operations, the site was used by a dairy farm and creamery from 1917 to 1927.

The Site has been historically owned and operated by Oxy Metals Corporation (division of Occidental Chemical Company), Hooker Chemical Company, Ford Motor Company, and Parker Chemical. These companies had active operations at the Site from 1928 to 1988.

During October 1981, Oxy Metal merged into Hooker Chemicals and Plastics Corporation and during August 1982, Hooker changed its name to Occidental Chemical. During October 1983, Parker Division of Occidental Chemical was sold to Parker Chemical Company. In April of 1987, Henkel Corporation acquired Parker Chemical and Parker Chemical continued to operate at the Site. On January 1, 1989, Amchem Products, Inc. and Parker Chemical Inc. merged into Henkel Corporation.

The Site was operated as a hazardous waste management facility from November 19, 1980, to 1988 (MID 058 723 867). During that time, seven distinct hazardous waste storage areas were present (see Figure 2). All structures on the Site were razed in 1993 and no operations have been conducted since that time.

HISTORIC CORRECTIVE ACTION

Assessment of the Site was initiated in 1982 when D'Appolonia Consulting Engineers, Inc. completed a preliminary hydrogeologic assessment. The following table presents the reports and activities that have been completed on the Site or adjacent to the Site.

Date	Report Name	Prepared By
10/29/82	Letter – Sediment organic analysis and heavy metal analysis	Michigan Department of Natural Resources
11/8/82	Letter Report - Preliminary Hydrogeologic Assessment, Parker Surface Treatment Products, Occidental Chemical Corporation, Morenci, Michigan	D'Appolonia Consulting Engineers, Inc.
12/30/83	Letter Report - Hydrogeologic Assessment, Parker Surface Treatment Products, Occidental Chemical Corporation, Morenci, Michigan	D'Appolonia Consulting Engineers, Inc.
February, 1988	Environmental Sampling Plan of the Parker Chemical Facility, Henkel Corporation Parker + Amchem	Huff & Huff, Inc.
October, 1989	Groundwater Monitoring Summary Report for Parker + Amchem, Morenci, Michigan	Dell Engineering, Inc.
3/30/90	Closure and Certification Parker + Amchem Storage Facility, Morenci, Michigan	Testing Engineers & Consultants, Inc.
11/24/1993 Revised	Closure Plan - Henkel Corporation, Parker + Amchem, Morenci, Michigan MID 058 723 867	The Dragun Corporation
1/31/95	Interim Soil Report - Closure Activities, Parker Amchem, Hazardous Waste Storage Pads, Morenci, Michigan Facility MID 058 723 867	The Dragun Corporation
3/16/95	Groundwater Investigation Report - Closure Activities, Draft, Parker Amchem, Hazardous Waste Storage Pads, Morneci, Michigan Facility MID 058 723 867	The Dragun Corporation
3/27/95	Groundwater Investigation Report - Closure Activities, Parker Amchem Hazardous Waste Storage Pads, Morenci, Michigan Facility MID 058 723 867	The Dragun Corporation
July 1997	Final Hydrogeologic Study and Wellhead Protection Area Delineation	Earth Tech
10/22/97	Soil Characterization Report, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation
4/22/98	Work Plan - Groundwater Sampling, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation
1/28/99	Groundwater Sampling, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation
2/14/00	Limited Soil Removal Report, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation

Date	Report Name	Prepared By
2/26/01	Work Plan - Groundwater Sampling, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation
8/30/01	June 2001 Groundwater Sampling, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation
7/18/02	Work Plan – Soil and Groundwater Sampling, Henkel Surface Technologies Facility, Morenci, Michigan MID 058 723 867	The Dragun Corporation
10/30/02	Summary Report, Soil and Groundwater Sampling, Supplemental Investigation to Address USEPA Concerns	The Dragun Corporation
7/20/04	Sediment sampling of Bean Creek conducted for USEPA	Techlaw
7/15/2005	Limited Soil Removal Report	The Dragun Corporation
8/17/05	Description of Current Conditions Report	The Dragun Corporation

During these activities, 113 soil samples, 64 groundwater samples, 26 site background soil samples, 86 verification samples, 16 soil leachate samples, and 9 sediment samples were collected and tested (see Figure 3).

A summary of the reports that relate to the closure of the Site with respect to the evaluation of metals and other compounds in soil and groundwater is presented in the following text.

Interim Soil Report - Closure Activities, January 1995

The soil investigation was conducted in accordance with the Approved Closure Plan dated November 24, 1993, addressing the closure of seven former hazardous waste storage areas. The soil investigation was conducted on April 5 - 9, 1994, and July 29, 1994.

Review of laboratory data revealed that copper, chromium, lead, and zinc were detected at concentrations in excess of the site-specific background concentrations in several soil samples. None of the soil samples contained concentrations of these metals in excess of their respective Michigan Department of Natural Resources (MDNR) Type B direct contact criteria. In addition, assessment of the leaching potential of soil indicated that all of the metals can remain on site at these concentrations.

Groundwater Investigation Report - Closure Activities, March 1995

With respect to metals in groundwater, the groundwater investigation consisted of (1) four quarterly groundwater sampling events conducted during April 1994, July 1994, October 1994, and January 1995; and (2) the collection and laboratory testing of 19 groundwater samples for the presence of dissolved chromium, dissolved copper, dissolved lead, and dissolved zinc.

Review of the results of the groundwater testing revealed these metals were not detected at concentrations in excess of the MDNR Type B cleanup criteria.

Soil Characterization Report, October 1997

HT submitted a Soil Characterization Report dated October 27, 1997, that documented soil sampling activities and test results with respect to soil sampling conducted during August 1997. The soil testing was conducted to determine whether concentrations of lead and chromium detected in soil at the Site constituted a hazardous waste. Based on the results presented in the Soil Characterization Report, the Michigan Department of Environmental Quality (MDEQ) agreed that concentrations of chromium and lead in soil at the Site do not constitute a hazardous waste.

The 1993 Closure Plan established site-specific background concentrations for metals in soil and indicated that soil at the hazardous waste storage areas would be cleaned up to "Type B criteria" (site-specific background). Consequently, although the MDEQ concluded that concentrations of chromium and lead did not constitute a hazardous waste, in the MDEQ's opinion, additional investigation was necessary to confirm that concentrations of chromium, copper, lead, and zinc, which were historically detected in soil at the Site, will not leach to groundwater, thus meeting Type B criteria as specified in the Closure Plan.

Based on a conference call on December 10, 1997, between representatives of the MDEQ and HT, the MDEQ stated that if HT conducted two groundwater sampling events, the results of which would show that metals are not leaching into groundwater, the Type B criteria established in the Closure Plan would be met.

Groundwater Sampling Report, January 1999

HT submitted a Groundwater Sampling report dated January 28, 1999, that documented groundwater sampling activities and test results with respect to two groundwater sampling events conducted during August and November 1998. The groundwater testing was conducted to confirm that concentrations of chromium, copper, lead, and zinc detected in soil at the Site are not leaching to groundwater.

Based on the results presented in the Groundwater Sampling Report, the MDEQ concurred in a letter dated March 8, 1999, that these metals in soil at the Site are not leaching to groundwater. Therefore, with the exception of Hazardous Waste Storage Area #6 that contained soil with concentrations of lead in excess of the direct contact cleanup criterion of 400 micrograms per kilogram (mg/kg), the other storage areas are closed. Closure of Hazardous Waste Storage Area #6 would require a limited removal of soil containing lead at concentrations above 400 mg/kg or the installation of an exposure barrier.

Limited Soil Removal Report, February 2000

The Dragun Corporation on behalf of HT directed limited soil removal activities at the HT facility located in Morenci, Michigan. The purpose of the limited soil removal was to remove soil that contained concentrations of lead in excess of the residential and commercial direct cleanup criterion of 400 mg/kg from the former Hazardous Waste Storage Area #6.

This limited soil removal was conducted in response to the MDEQ-WMD letter dated March 8, 1999, regarding the previously submitted Groundwater Sampling Report dated January 28, 1999. In this letter, the MDEQ concurred that metals in soil at the Site are not leaching to groundwater; consequently, only soil with metals concentrations above direct contact cleanup criteria require removal to meet the "Type B" cleanup criteria presented in the Revised Closure Plan approved during 1993. Based on previous testing at the Site, only a limited amount of soil in former Hazardous Waste Storage Area #6 required removal to meet these criteria.

To address these concerns, The Dragun Corporation directed the removal of soil from former Hazardous Waste Storage Area #6 and collected verification samples to confirm that a sufficient volume of soil was removed. These activities were conducted between August 19, 1999, and October 15, 1999, in accordance with the approved Work Plan dated April 14, 1999.

In general, these activities included (1) excavation and off-site disposal of approximately 1,560 cubic yards of soil and (2) collection and laboratory testing of 85 verification soil samples for the presence of total lead. The final excavation measured approximately 160 feet by 80 feet and varied in depth between approximately two and four feet. Approximately 1,560 cubic yards of soil were excavated from this area and disposed off site at a Type II landfill. The excavation was backfilled with clean sand fill material.

All of the applicable verification samples contained concentrations of lead less than the residential direct contact criterion of 400 mg/kg. Based on this information and the previously submitted reports to the MDEQ, the closure requirements outlined in the approved Closure Plan were obtained.

June 2001 Groundwater Sampling Report, August 2001

HT submitted a Groundwater Sampling report dated August 30, 2001, that documented groundwater sampling activities and test results with respect to one groundwater sampling event conducted during June 2001. This groundwater sampling event was conducted in response to the December 7, 2000, meeting between representatives of the USEPA Region 5 and HT.

During that meeting, it was decided that in lieu of signing a Voluntary Corrective Action Agreement or entering into a Consent Order, HT would conduct a groundwater-sampling event to evaluate current groundwater quality at the site. This information would be used to further

establish that the USEPA's Environmental Indicator, migration of contaminated groundwater, has been achieved. The USEPA had already agreed that the Environmental Indicator concerning human exposures at the site was under control and had been achieved.

Based on the results of the groundwater-sampling event, volatile organic compounds were not present in the groundwater at unacceptable concentrations. Accordingly, the USEPA's Environmental Indicators at this site have been achieved.

Summary Report, Soil and Groundwater Sampling Supplemental Investigation to Address USEPA Concerns – 2002

On behalf of HT, The Dragun Corporation conducted certain sampling and testing activities at the Site. These sampling activities were conducted pursuant to the Work Plan dated July 18, 2002, approved by the USEPA Region 5 by letter, dated August 21, 2002. The Work Plan was prepared in response to the June 26, 2002, conference call between representatives of the USEPA Region 5 and HT. The sampling activities were conducted on September 17 and 18, 2002. Mr. Ron Stone of the MDEQ was present on behalf of the USEPA during the sampling activities.

The sampling included three investigative tasks to evaluate five outstanding concerns of the USEPA at the Site. These tasks include (1) installation of piezometers to evaluate groundwater flow directions and the hydraulic boundary conditions of Bean Creek, (2) sampling the four existing monitoring wells for VOCs to evaluate current groundwater quality, and (3) sampling soils along and outside of the west fence line of the Site to evaluate current soil quality. Based on these investigative tasks, it is The Dragun Corporation's opinion that this information is sufficient to satisfy the USEPA's concerns at this Site.

Evaluation of Groundwater Flow at Bean Creek: Site-specific data from this investigation indicate that groundwater from the Site cannot underflow Bean Creek. First, the thin water-bearing zone beneath Bean Creek is not conducive to underflow. Second, vertical hydraulic gradients indicate an upward vertical hydraulic gradient. Finally, groundwater elevations are higher on either side of Bean Creek, which means that groundwater from both sides of Bean Creek discharges into Bean Creek and there can be no underflow. Accordingly, the down gradient receptor of groundwater from the Site is limited to Bean Creek.

Evaluation of Groundwater Quality: Groundwater samples from the four existing monitoring wells were submitted to a laboratory and analyzed for the presence of VOCs. Vinyl chloride, 1,1-dichloroethene, cis-1,2-dichloroethene, and trichloroethene were detected in one monitoring well (MW-3).

The concentrations of the four VOCs detected in groundwater from MW-3 during the September 18, 2002, sampling event are consistent with historical data. This information does not indicate the presence of a significant source of chlorinated VOCs up gradient of MW-3.

The Dragun Corporation compared the groundwater laboratory results to Part 201 Cleanup Criteria pursuant to Michigan's Natural Resources and Environmental Protection Act (NREPA; P.A. 451 of 1984, as amended). Vinyl chloride was detected in MW-3 at a concentration in excess of the drinking water criterion and the Groundwater/Surface Water Interface (GSI) criterion.

Although vinyl chloride is present at a concentration in excess of the drinking water criterion, it is The Dragun Corporation's opinion that this exposure pathway is not relevant. The basis for this opinion is (1) the limited saturated thickness at the Site would not be conducive to yield a sufficient volume of water for a drinking water well, (2) the saturated sands are approximately 12 to 17 feet below ground level and health department ordinances restrict the installation of drinking water wells to below 25 feet below ground level, (3) the confirmation of Bean Creek as a hydraulic boundary prevents the migration of the vinyl chloride beyond Bean Creek, and (4) HT is prepared to record a deed restriction on the property restricting the use of shallow groundwater.

Although vinyl chloride is present at a concentration in excess of the GSI criterion, Part 201 allows for concentrations of chemicals above generic GSI criteria to vent into surface water if it is supported by a mixing zone analysis. The Dragun Corporation conducted a mixing zone analysis of the GSI scenario at the Site. Based on the Site conditions and the mixing zone analysis, the mixing zone dilution factor for the Site at Bean Creek is eight (conservatively estimated using discharge along entire length of Site along Bean Creek). Accordingly, based on the receiving capacity of Bean Creek relative to the groundwater discharge volume, vinyl chloride concentrations, eight times that of the generic GSI criterion of 15 µg/L (120 µg/L), could be discharged. Based on this information, it is The Dragun Corporation's opinion that the 19 µg/L concentration of vinyl chloride detected at MW-3 does not exceed GSI criteria.

Evaluation of Current Soil Quality: Sixteen soil samples were submitted to a laboratory and analyzed for the presence of VOCs, polynuclear aromatic compounds (PNAs), metals, and polychlorinated biphenyls (PCBs). The Dragun Corporation compared the soil laboratory results to Part 201 Cleanup Criteria.

Laboratory Testing of Soil – VOCs: Xylenes were detected in soil sample HA-5 at a concentration (710 µg/kg) slightly in excess of the GSI cleanup criterion (700 µg/kg). Based on the mixing zone analysis of the Site, it is The Dragun Corporation's opinion that the concentration of xylenes detected in soil at HA-5 does not exceed the GSI criterion. Additionally, this concentration of xylenes does not exceed any other Part 201 residential cleanup criteria including the direct contact criterion of 150,000 µg/kg. Accordingly, this concentration of xylenes detected in soil at the Site does not pose an unacceptable risk.

Laboratory Testing of Soil – PNAs: Benzo(a)pyrene and dibenzo(ah)anthracene were detected in soil sample HA-10 at concentrations in excess of the residential direct contact cleanup criteria. Neither of these PNA concentrations exceeds the industrial direct contact cleanup criterion. Since HT is prepared to place a deed restriction on the Site that will limit

property use, the concentrations of these PNAs detected in the soil at the Site do not pose an unacceptable risk.

Additionally, fluoranthene and phenanthrene were detected in soil sample HA-10 at concentrations slightly in excess of their respective GSI cleanup criteria. Based on the mixing zone analysis of the Site, it is The Dragun Corporation's opinion that concentrations of PNAs detected in soil do not exceed GSI criteria.

Laboratory Testing of Soil – Metals: Hexavalent chromium, lead, and zinc were detected in soil at concentrations above the generic residential cleanup criteria.

Hexavalent chromium was detected in soil sample HA-14 at a concentration in excess of the GSI cleanup criterion. Based on the mixing zone analysis of the Site, it is The Dragun Corporation's opinion that this concentration of hexavalent chromium detected in soil at HA-14 does not exceed GSI criterion. Additionally, The Dragun Corporation previously conducted leach testing of soil and groundwater sampling in conjunction with MDEQ-approved work plans and demonstrated that metals in soil at the Site do not pose an unacceptable risk to groundwater.

Lead was detected in soil sample HA-1 at a concentration in excess of the residential direct contact cleanup criterion. Note that HA-1 was located in the area of soil that was excavated and properly disposed in May and June of 2005.

Zinc was detected in soil sample HA-12 at a concentration in excess of residential and industrial drinking water criteria. As previously discussed, the drinking water pathway at the Site is not applicable.

Laboratory Testing of Soil – PCBs: PCBs were not detected in any of the 16 soil samples submitted for testing.

Summary: In summary, based on this information, residual chemical concentrations in soil and groundwater at the Site do not pose an unacceptable risk to human health or the environment based on MDEQ Part 201 cleanup criteria and considering the property use restrictions that HT has proposed and is prepared to implement.

Sediment Testing of Bean Creek

On behalf of USEPA Region 5, TechLaw conducted sediment sampling and testing activities in Bean Creek, located west of the Site. These sampling activities were conducted in response to the USEPA Region 5 belief that historic activities conducted on the HT property may have impacted the sediment of the creek. The sampling activities were conducted on July 20, 2004. Mr. John Koehnen, Mr. Jeffrey Surfus, and Ms. Kristi Pawski were present on behalf of TechLaw. Mr. John Nordine was present on behalf of the USEPA during the sampling activities.

Mr. Allan Clifford Lawton of The Dragun Corporation was present on behalf of Henkel.

Sediment samples were collected from four locations near the east bank of Bean Creek. The sediment samples were tested for VOCs, SVOCs, PCBs, and metals. Metals analysis included aluminum, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, titanium, vanadium, and zinc.

Review of the results of the sediment testing revealed that it does not appear that historical operations at the HT property have impacted the sediments in Bean Creek.

Area Identified in USEPA's 2005 AAO

In Section V.A of the AAO, it was agreed that HT would conduct additional soil removal between the former Waste Storage Area 6 and Bean Creek to address outstanding concerns of the USEPA at the Site, provided conditions along the bank of Bean Creek remain stable.

During the 1999 soil removal (Dragun, 2000), significant debris was noted in the western sidewall of the excavation near Area 6. This debris was unrelated to historical operations conducted by HT and its predecessors and their waste storage activities at the facility. The debris consisted of deteriorated metal/tin cans, broken milk bottles, china cups, etc., appearing consistent with reported historical use of the Site by a dairy farm and creamery. It appeared that the low-lying area along Bean Creek had been filled with containers and waste material from the dairy farm. Consequently, although some of the verification samples exceeded the direct contact criterion of 400 mg/kg, it is believed that elevated levels of lead are due to the debris (likely solder from the tin cans) and not related to the former waste storage activities of HT. In the AAO, it was acknowledged that this contamination may not have been caused by HT.

Limited Soil Removal Report, July 2005: On behalf of HT, The Dragun Corporation directed limited soil removal activities at the HT facility located in Morenci, Michigan. As noted above, this work was conducted in response to the AAO. The Dragun Corporation documented the soil removal activities in a report titled "Limited Soil Removal Report; Former Henkel Morenci Facility; Morenci, Michigan; USEPA ID No: MID 058 723 867," dated July 18, 2005. This report was previously submitted to the USEPA; however, a summary of the report is presented in the following text.

The purpose of the excavation was to remove a limited amount of soil such that concentrations of lead remaining in soil are less than residential direct contact cleanup criteria of 400 milligrams per kilogram, provided conditions along the bank of Bean Creek remain stable.

The removal of soil from between the former Waste Storage Area 6 and Bean Creek former Hazardous Waste Storage Area #6 was conducted between May 17, 2005 and June 3, 2005, in accordance with the approved Work Plan dated March 9, 2005.

In general, these activities included (1) excavation and off-site disposal of approximately 1,430 cubic yards of soil, (2) collection and laboratory testing of 20 verification soil samples for the presence of total lead, and (3) backfilling the excavation with clean sand. The excavation was initiated along the western boundary of the former Area 6 excavation and proceeded to within 5 to 7 feet of the bank of Bean Creek (see Figure 3). The excavation varied in depth from two to 10 feet below the ground level and was generally 6 to 8 feet deep along the west side of the excavation (adjacent to Bean Creek). Any further excavation would have jeopardized the bank stability and caused materials to fall into Bean Creek. Based on measurements taken by The Dragun Corporation during the excavation activities, the excavation floor had a total area of approximately 7,600 square feet (ft^2). The floor of the excavation was terminated in native fine to coarse sand. The excavation intersected the water table at several locations near Bean Creek.

The excavated soils were disposed off site at the Arbor Hills Landfill (Type II landfill) in Northville, Michigan. Soil verification samples were collected during the soil excavation activities from May 17 through May 20, 2005. The verification samples were submitted to Karr Laboratories in Kalamazoo and tested for total lead. Review of the laboratory data indicates that all eight of the floor verification samples and eight of the 12 sidewall verification samples contained concentrations of total lead that ranged from 4 to 55 mg/kg, one to two magnitudes below the cleanup target of 400 mg/kg.

Each of the four verification samples that exceeded the cleanup target were collected from the dairy/creamery bottle and tin can debris located in the west wall of the excavation. These four verification samples contained concentrations of total lead that ranged from 427 to 793 mg/kg. However, since any further excavation would have jeopardized Bean Creek bank stability and caused materials to fall into the creek; and since the AAO indicated that soil excavation would proceed along the western side of the former excavation area, as long as conditions along the bank of Bean Creek remain stable, it is The Dragun Corporation's opinion that objectives set forth in the AAO have been satisfied.

The USEPA responded to the Limited Soil Removal Report in a letter dated July 28, 2005. The letter indicated that soil removal activities met the requirements of the AAO.

DOCC Report, August 17, 2005: The Dragun Corporation on behalf of HT prepared the DOCC Report of the Former HT Facility in Morenci, Michigan. As noted above, this report was completed in response to the AAO. The DOCC Report documented the recent and historic investigative and remedial activities at the Site. In the DOCC Report, The Dragun Corporation states that "it is The Dragun Corporation's opinion that objectives set forth in the AAO have been satisfied."

The USEPA responded to the DOCC Report in a letter dated September 15, 2005. The letter indicated that the DOCC Report accurately states the current conditions at the facility and the USEPA approves this report.

EVALUATION OF POTENTIAL RISK TO HUMAN HEALTH AND ENVIRONMENT

Comprehensive sampling of soil, historical fill material, groundwater, and sediments was conducted in conjunction with the investigations and soil removal activities that have been implemented at the Site. The Dragun Corporation evaluated the laboratory data relative to generic industrial cleanup criteria that have been developed by the MDEQ (Part 201 cleanup criteria; MDEQ, 2004). The Dragun Corporation's evaluation of potential risk to human health and the environment is further discussed in the following text.

With respect to soil and fill testing, The Dragun Corporation compared the laboratory data to generic industrial and commercial II, III, and IV cleanup criteria protective of the following exposure pathways: (1) Soil Contamination Risks Posed from Direct-Contact Exposure, (2) Soil Contamination Risks from Ambient Air Inhalation Exposure, (3) Soil Contamination Risks from Indoor Air Inhalation Exposure, (4) Soil Contamination Risk to Groundwater Quality that May Pose a Dermal Contact Hazard, (5) Soil Contamination Risk to Drinking Water Quality, and (6) Soil Contamination Risk to Groundwater Quality that May Impact Surface Water Quality.

Additionally, the following groundwater exposure pathways were evaluated: (1) Groundwater Contact Exposure, (2) Drinking Water Exposure, (3) Groundwater Quality that May Impact Surface Water Quality, and (4) Groundwater Contamination Risks from Indoor Air Inhalation Exposure. In addition, groundwater laboratory data were also compared to the water solubility, flammability and explosivity screening levels, and acute inhalation screening levels.

As previously presented, zinc was detected in one soil sample at a concentration in excess of residential and industrial drinking water criteria and vinyl chloride was detected in MW-3 at a concentration in excess of the drinking water and GSI criteria. Additionally, xylenes, fluoranthene, phenanthrene, and hexavalent chromium were each detected in one soil sample at concentrations in excess of GSI cleanup criteria.

However, as previously discussed, it is The Dragun Corporation's opinion that the drinking water exposure pathway is not relevant. The basis for this opinion is (1) the limited saturated thickness at the Site would not be conducive to yield a sufficient volume of water for a drinking water well, (2) the saturated sands are approximately 12 to 17 feet below ground level and health department ordinances restrict the installation of drinking water wells to below 25 feet below ground level, (3) the confirmation of Bean Creek as a hydraulic boundary prevents the migration of compounds beyond Bean Creek, and (4) HT is prepared to record a deed restriction on the Site restricting the use of shallow groundwater.

Additionally, based on the previously discussed mixing zone analysis of the Site, it is The Dragun Corporation's opinion that the concentration of compounds detected in soil and groundwater at the Site do not exceed GSI criteria, relative to the protection of Bean Creek.

Review of the results of the sediment testing (Tech Law, 2004) revealed that it does not appear that historical operations at the HT property have impacted the sediments in Bean Creek.

Benzo(a)pyrene and dibenzo(ah)anthracene were detected in one soil sample (HA-10) at concentrations in excess of the residential direct contact cleanup criteria. Neither of these PNA concentrations exceeds the industrial or commercial II, III, or IV direct contact cleanup criteria. Since HT is prepared to place a deed restriction on the Site that will limit property use to industrial or commercial II, III, or IV operations, the concentrations of these PNAs detected in the soil at the Site do not pose an unacceptable risk.

Lead was detected in soil sample HA-1 at a concentration in excess of the residential direct contact cleanup criterion. Note that HA-1 was located in the area of soil that was excavated and properly disposed in May and June of 2005. Verification samples collected during the May and June 2005 excavation activities were submitted to Karr Laboratories in Kalamazoo and tested for total lead. Review of the laboratory data indicates that all eight of the floor verification samples and eight of the 12 sidewall verification samples contained concentrations of total lead that ranged from 4 to 55 mg/kg, one to two magnitudes below the cleanup target of 400 mg/kg.

Each of the four verification samples that exceeded the cleanup target were collected from the dairy/creamery bottle and tin can debris located in the west wall of the excavation. These four verification samples contained concentrations of total lead that ranged from 427 to 793 mg/kg. All of the soil verification samples contained concentrations of lead below the industrial or commercial II, III, or IV direct contact cleanup criterion of 900 mg/kg. Since any further excavation would have jeopardized Bean Creek bank stability and caused materials to fall into the creek; and since the AAO indicated that soil excavation would proceed along the western side of the former excavation area, as long as conditions along the bank of Bean Creek remain stable, it is The Dragun Corporation's opinion that objectives set forth in the AAO have been satisfied.

The USEPA responded to the Limited Soil Removal Report in a letter dated July 28, 2005. The letter indicated that soil removal activities met the requirements of the AAO.

As noted above, all of the soil, fill material, and groundwater samples that have been collected at the Property meet generic cleanup criteria that are protective of human health from an industrial or commercial II, III, or IV land use. To ensure that the Property continues to be used in an industrial or commercial II, III, or IV capacity, HT will restrict current and future use of the site to industrial land use or commercial II, III, or IV activities via a deed restriction. Additionally, HT will record a deed restriction on the property restricting the use of shallow groundwater.

In summary, based on this information, residual chemical concentrations in soil and groundwater at the Site do not pose an unacceptable risk to human health or the environment based on MDEQ Part 201 cleanup criteria and considering the property use restrictions that HT has proposed and is prepared to implement.

FINAL CORRECTIVE MEASURES PROPOSAL

Based on the findings of the previous investigations, The Dragun Corporation proposes the following corrective measures plan. The proposed corrective action for the Site is straight forward and consists of the following element:

- Implementation of land use restrictions for the Site

Implementation of Land Use Restrictions

As discussed previously, all of the soil, fill material, and groundwater samples that have been collected at the Site meet generic cleanup criteria that are protective of human health for industrial and commercial II, III, and IV land use. To ensure that the Site continues to be used in an industrial or commercial II, III, or IV capacity, HT will restrict current and future use of the site to industrial or commercial II, III, or IV land use via a deed restriction. Additionally, HT will record a deed restriction on the Site restricting the use of shallow groundwater.

In summary, based on this information, residual chemical concentrations in soil and groundwater at the Site do not pose an unacceptable risk to human health or the environment based on MDEQ Part 201 cleanup criteria and considering the property use restrictions that HT has proposed and is prepared to implement.

It is The Dragun Corporation's opinion that no further corrective measures are required beyond the implementation of the deed restrictions. Additionally, it is The Dragun Corporation's opinion that, since no further corrective measures are required, a Final Remedy Construction Completion Report is not necessary.

CONCLUSIONS

The Dragun Corporation on behalf of Mr. Jack Garavanta of HT prepared this FCM Proposal for the Former HT Facility in Morenci, Michigan pursuant to Section V (B) of the AAO negotiated between HT and the USEPA, Region 5 (effective date February 14, 2005). The FCM Proposal provides a brief summary of the history and current status of operations, potential areas of concern, and investigations and corrective actions conducted at the former HT Facility.

In the DOCC Report, The Dragun Corporation states that "it is The Dragun Corporation's opinion that objectives set forth in the AAO have been satisfied." The USEPA responded to the DOCC Report in a letter dated September 15, 2005. The letter indicated that the DOCC Report accurately states the current conditions at the facility and the USEPA approves this report.

As discussed previously, all of the soil, fill material, and groundwater samples that have been collected at the Site meet generic cleanup criteria that are protective of human health for industrial and commercial II, III, and IV land use. To ensure that the Site continues to be used in an industrial or commercial II, III, or IV capacity, HT will restrict current and future use of the site to industrial or commercial II, III, or IV land use via a deed restriction. Additionally, HT will record a deed restriction on the Site restricting the use of shallow groundwater.

In summary, based on this information, residual chemical concentrations in soil and groundwater at the Site do not pose an unacceptable risk to human health or the environment based on MDEQ Part 201 cleanup criteria and considering the property use restrictions that HT has proposed and is prepared to implement.

It is The Dragun Corporation's opinion that no further corrective measures are required beyond the implementation of the deed restrictions. Additionally, it is The Dragun Corporation's opinion that, since no further corrective measures are required, a Final Remedy Construction Completion Report is not necessary.

Upon USEPA approval of these remedy concepts, draft land use restrictions will be prepared and forwarded to the USEPA for review.

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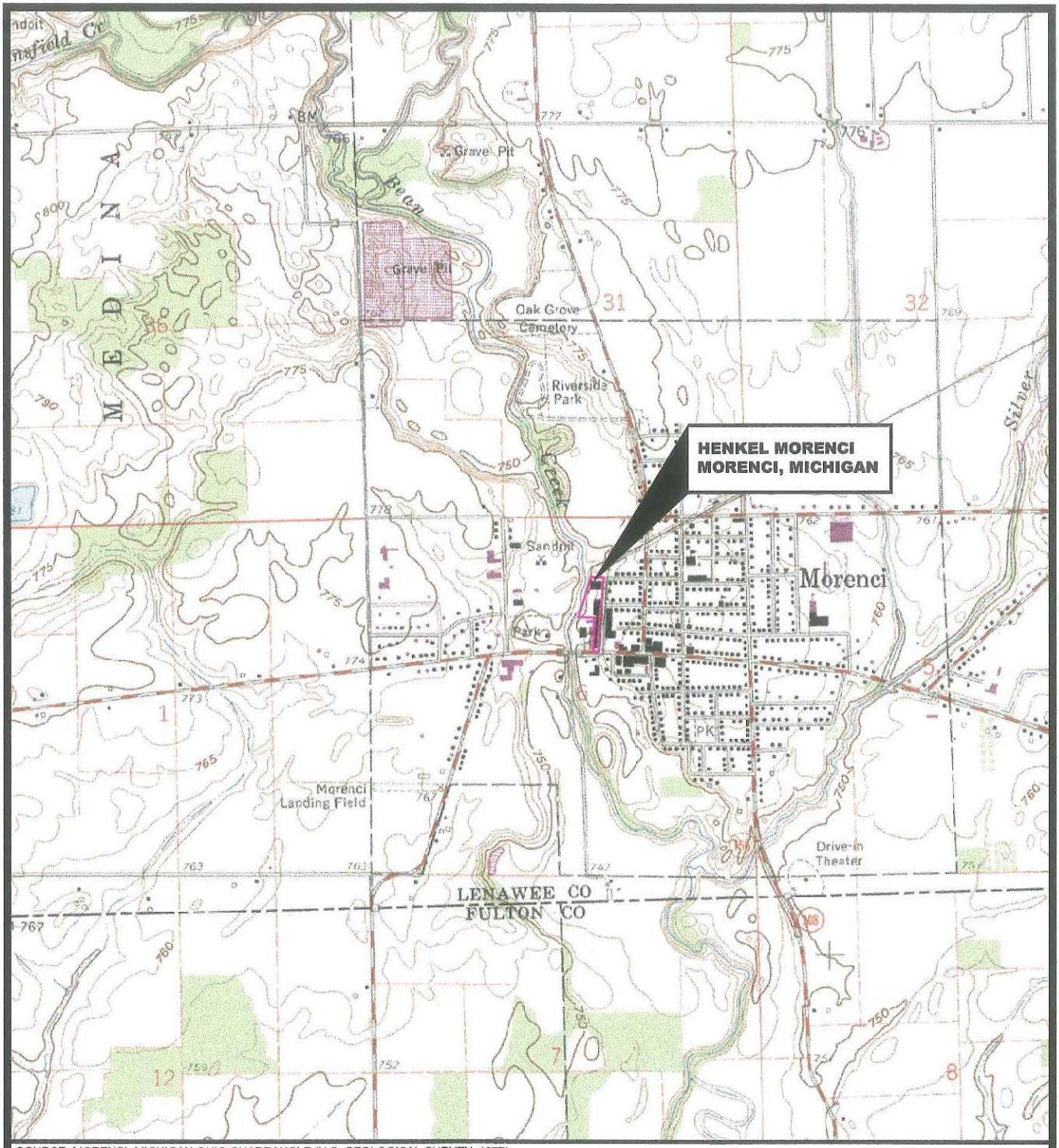
FIGURES



SOURCE: MORENCI, MICHIGAN-OHIO QUADRANGLE (U.S. GEOLOGICAL SURVEY, 1977).

OHIO

QUADRANGLE LOCATION

SCALE

0 2000 FEET

FIGURE 1
SITE LOCATION MAP
HENKEL MORENCI
MORENCI, MICHIGAN

CAD\USGS MORENCI\1004-05 07.18.05

The Dragun Corporation

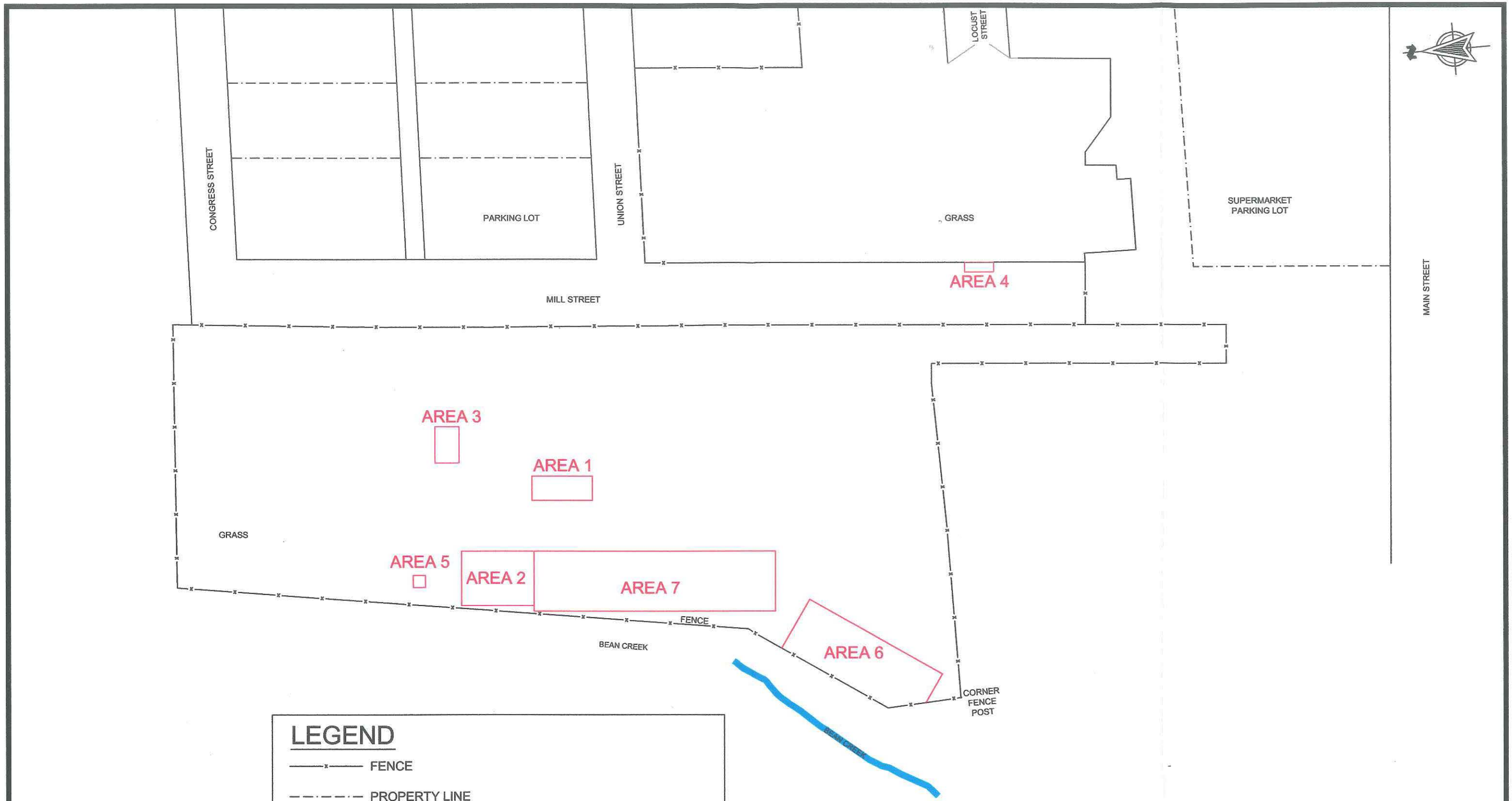


FIGURE 2
PROPERTY LOCATION MAP
HENKEL MORENCI
MORENCI, MICHIGAN

The Dragun Corporation

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